

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)	
)	
Revitalization of the AM Radio Service)	MM Docket No. 13-249
)	
)	

COMMENTS OF MARK D. HUMPHREY

In response to the Commission's *Notice of Proposed Rulemaking* in the above-captioned proceeding, I hereby submit the following comments. By way of personal background, I've held an FCC First Class/General Radiotelephone Operator License since 1975 and have been active in the field of broadcast engineering and management for 40 years. I am presently certified as a Professional Broadcast Engineer (CPBE) by the Society of Broadcast Engineers (SBE) and self-employed as a consultant to several clients who own and operate AM stations in the Northeast US, among other broadcasters. I am also a part-owner of WCJW, Warsaw, New York and its five associated FM translators.¹

Radio's greatest strengths are localism, convenience and immediacy.

Today's listeners expect local radio programming to be readily available at any time -- at home, in the car, and at work -- especially during special events and emergencies. An AM station that fails to provide consistent 24-hour coverage to a majority of the potential audience in its local market faces a serious disadvantage -- which leads to my first point:

¹ WCJW (Facility ID 37858) is a Class D AM station on 1140 kHz serving the largely rural area between metropolitan Buffalo and Rochester, New York. It is the primary station for co-owned FM translators W279BO, Warsaw, NY; W265BX, Nunda, NY; W282BQ, Avon, NY; W283AU, Eagle, NY; and W288BZ, Batavia, NY. The majority owner and general manager of WCJW is Lloyd B. Lane, who has resided in Warsaw since he acquired the station license in 1984.

FM Translators Offer a Practical Solution to the Day/Night Problem

As others have noted, one of the most sensible actions of the Commission in recent years was approval of RM-11338 (MB Docket No. 07-172) allowing the programming of AM stations to be carried on FM translators. This didn't require research and development of sophisticated new technology – it was simply a matter of the FCC saying "yes" to a change in primary station eligibility that had been proposed by various parties for years. Shortly after RM-11338 was filed, business partner Lloyd Lane and I decided to acquire unbuilt translator authorizations that could be relocated to the population centers of Warsaw, Nunda, and Batavia, NY, and we began operating these facilities under special temporary authority pending completion of the AM Translator rulemaking proceeding. Our experience with these translators has been an unqualified success.

WCJW is a "strict daytimer" with no legal provision for night operation in the AM band,² but these FM translators have made fulltime programming service available across much of our daytime service area, allowing early morning agri-business reports, local news and severe weather alerts, as well as live coverage of evening high school sporting events. Prior to introduction of our FM service, many residents of the villages of Warsaw and Nunda experienced problems receiving high quality signals from other FM stations due to terrain blockage and multipath interference. Batavia, a nearby city of over 15,000 persons (which once was considered worthy of two Class B FM allotments³ but ended up with none, after later high power assignments were made to Buffalo) now enjoys a strong fulltime signal from our translator W288BZ. As discussed in more

² WCJW must cease operation at local sunset to protect secondary skywave service of co-channel WRVA, Richmond, VA in an area that includes a large portion of western New York State. WCJW's pre-sunrise operation (PSRA) is limited to the 15-minute period before local sunrise in certain months of the year. For example, in January, PSRA does not begin until 7:30 AM and full power operation at 2.5 kW is allowed only between 7:45 AM and 5:00 PM local time.

³ The 1948 Broadcasting-Telecasting Yearbook on p. 603 lists Channels 235 and 259 as tentative Class B allocations to Batavia, NY as of January 1, 1948. Operation on Channel 235 was later precluded by the assignment of Channel 233B to Buffalo (now licensed to WNED-FM) and Channel 259 is no longer available in Batavia since Channel 258B was assigned to Buffalo (WDCX-FM).

detail in Appendix A, WCJW's translators have resolved FM service deficiencies in those communities.

Translator Filing Window Priorities

Based on firsthand experience, I urge the Commission to structure the proposed FM Translator filing window to assign highest priority to Class D "daytimers", followed by Class B and C fulltime AM stations that fail to provide a minimum of 50 percent of the population within their respective 5 mV/m daytime service areas with interference-free nighttime service. Special consideration should also be given to translator proposals that would provide any incorporated rural community or Census Designated Place with a first or second commercial FM signal of 60 dBμ or greater, based on "Longley-Rice" or a similar terrain-sensitive VHF propagation model. Use of this coverage prediction algorithm is generally more accurate than the traditional "F(50,50) method", which often overestimates coverage of valley-based communities.

To help meet the anticipated high demand for new FM translator authorizations, and to allow AM broadcasters to improve existing translator facilities, I suggest the Commission consider some regulatory changes that would increase availability of suitable FM channels:

Reduce or Eliminate "IF" Distance Separation Requirements for Translators

47 CFR §74.1204(g) requires all FM translators operating at 100 watts or greater power to meet the same minimum Intermediate Frequency ("IF") spacing requirements that apply to 6 kW/100 meter Class A FM stations.⁴ FM translators short-spaced under this section are presently limited to 99 watts effective radiated power (ERP). Since translators cannot exceed 250 watts, there is no valid technical reason to require any translator to meet full 6 kW Class A IF separation requirements, rather than the less-

⁴ These "10.6/10.8 MHz "distance separation requirements are set forth in §73.207(b)(1).

stringent rule applicable to "3000 Watt" Class A facilities, found in 47 CFR §73.213(c)(1). I recommend that the Media Bureau immediately allow any translator applicant to substitute the 73.213 spacing table instead of the overly-restrictive 73.207 table for purposes of showing IF distance separation compliance.

This raises the question whether translator IF interference protection⁵ is still required at all. The IF rule is similar to "UHF taboos"⁶ that were drawn up in the era of analog TV. As mentioned in my December 2008 comments in the matter of Docket 99-325,⁷ I once had a 1962-vintage General Electric T-1000 receiver that was very susceptible to IF interference, but the performance of FM receivers (and TV sets) has improved in recent years. The Commission should take another step forward and consider whether repeal of the IF rule is appropriate for translators and other FM stations of 250 watts and less.

Allow "Intervening Terrain" Showings in Translator Applications

47 CFR §74.1204(d) already specifies that "...An [FM Translator] application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population, or such other factors as may be applicable." This rule is cited in requests for second- and third-adjacent contour overlap waivers, which are routinely granted by the Media Bureau⁸ if a lack of population in the interference area is demonstrated. Some opportunities to construct new

⁵ As implied in 47 CFR §73.213(b), a potential for IF interference is assumed to exist in areas where the 36 mV/m (91 dBμ) contours of two FM stations overlap. Some early FM receivers were susceptible to poor mixer performance, which would result in undesired products of two strong incoming signals separated by 10.6 or 10.8 MHz. In certain instances, a second-order intermodulation product could pass through the 10.7 MHz intermediate frequency stage to the FM demodulator, and interfere with desired reception of other weaker FM signals.

⁶ 47 CFR §73.698 Table II

⁷ Please see <http://apps.fcc.gov/ecfs/document/view?id=6520190203> Concerns I expressed in the 2008 comments about the potential for increased IF interference as a result of the digital power increase were not addressed by the Commission. Therefore, the record in that proceeding suggests that this "taboo" can now be eliminated.

⁸ This is known as the "Living Way Ministries" waiver.

FM translators (and to expand service of present translators) could be opened if detailed terrain showings were considered, as this rule apparently allows. I suggest that the Longley-Rice model be accepted for supplemental translator interference predictions, in a manner similar to its use in principal community coverage showings for full-service FM stations.

In particular, a translator applicant would have the option of submitting a Longley-Rice supplemental showing in situations where terrain between the translator site and a protected commercial Class B or B1 FM facility departs widely from the standard "delta-H" roughness assumption of 50 meters. Overlap of the F(50,50) 60 dB μ service contour of the protected station by the applicable F(50,10) interference contour of the translator would still be prohibited, but a Longley-Rice prediction could be used to demonstrate lack of interference outside the 60 dB μ contour of the commercial B or B1 FM station. I note that the recent "FM Digital ERP Increase" decision protects all FM stations at the 60 dB μ contour, regardless of class.⁹ This suggests that full contour protection out to 54 or 57 dB μ is no longer considered as important as it was 30 years ago.

Other Comments Regarding FM Translators

The Commission should revise Form 349 and make other necessary rule changes that would allow FM translator stations to construct and operate auxiliary antennas, under the same conditions already stated in 47 CFR §73.1675.

⁹ January 27, 2010 *Order in MM Docket 99-325* at Paragraph 18: The Agreement specifies that FM station eligibility for digital ERP increases beyond 6 dB is based upon protection of an analog station's 60 dB μ contour. We recognize that the Commission's Rules specify different protected contours for Class A, C3, C2, C1, C0 and C FM stations (60 dB μ) than for Class B1 FM stations (57 dB μ) and Class B FM stations (54 dB μ) in the non-reserved band. However, for the limited purpose of determining maximum permissible FM Digital ERP greater than -14 dBc, we will base all predictions of maximum permissible FM Digital ERP on calculations at the potentially affected analog FM station's 60 dB μ contour. However, the mitigation and remediation procedures set forth below will apply to all instances of alleged interference within the protected service contours of potentially affected stations

The present 25-mile limit on FM translator coverage¹⁰ should be relaxed in situations in which the 5 mV/m "principal community" day contour of a Class B, C, or D AM station exceeds 25 miles in some directions, but the station in question doesn't provide critical hours or night service beyond this distance. In such cases, an extension in FM translator coverage beyond the 25-mile radius would be allowed anywhere within the 5 mV/m day contour, provided that the translator complies with other regulations. I note that the annual regulatory fee for AM stations is based on total population within the 5 mV/m service contour regardless of distance, so it stands to reason that a Class B, C, or D licensee with day vs. night coverage disparities should be allowed to continue serving these listeners after sunset using the facilities of an FM translator.

I agree that any translator granted to an AM station during the proposed filing window should be permanently "linked" to the parent station.

A final thought on the topic of AM translators: Through conversations with various WCJW listeners, I've learned that most rely on our FM services within the respective translator coverage areas, because the FM signals provide fulltime programming and superior audio quality. A considerable number of listeners find the daytime-only AM signal useful only as a "fill-in" service in locations the translator signals fail to reach, or as a long-range service they can receive while driving to distant locations such as Buffalo and Rochester. This is not to suggest the AM signal is no longer needed, but these comments indicate that most members of the general public actually consider our FM service "primary", with AM serving a "secondary" role, contrary to official FCC designations. With this in mind, shouldn't some translators (particularly those in rural areas) be awarded primary status, in the same manner as certain LPTV stations were designated "Class A" facilities?

¹⁰ 47 CFR §74.1201(g)

Elimination of "Ratchet Rule"

This rule was introduced with good intention, but seems to have created more problems than it has solved, so I favor its elimination.

Modulation Dependent Carrier Control

Experience with MDCL has shown that it conserves energy but causes few serious side-effects, so I favor allowing stations to use it on a routing basis. WNTP, a local station here in the Philadelphia market, has been using it successfully for several months. On a related topic, the Commission should also consider eliminating the 125% positive peak modulation limit.

Modification of AM Antenna Efficiency Standards

I am in favor of the proposal to reduce or eliminate the present minimum effective field strength requirements. I view these as a holdover from the days when nominal AM power levels were limited to the standard values of 250 W, 500 W, 1 kW, 5 kW, etc. Today, most Class B and D stations are permitted to "dial-a-power" at intermediate levels, as long as the applicable interference protection requirements are met. For many years, FM broadcasters been allowed reasonable flexibility in choosing an antenna gain that is most appropriate for the situation at hand – AM licensees should be extended the same courtesy.

Power Line RF Interference Problem

Paragraph 5 of the *Notice of Proposed Rulemaking* briefly mentions a problem many AM broadcasters face concerning electrical interference. I agree that AM reception along most public roads (with the exception of rural limited-access highways) is too often degraded by impulse noise -- commonly referred to as "hash", "EMI" or "RFI" -- radiated

from aerial transmission and distribution lines serving utility customers along those routes. This raspy noise -- easily identified as it is harmonically related to the 60 Hertz AC power frequency -- is generated by malfunctioning insulators and other hardware attached to high voltage cables, and can propagate for thousand of meters along the conductors in apparent violation of 47 CFR § 15.13, 15.15, and 15.5. Even at highway speeds, an AM listener traveling parallel to a defective line is often forced to endure several minutes of degraded reception. I've observed that many of these RFI problems remain uncorrected for months, and sometimes years. The Commission should immediately step up enforcement of the present Part 15 rules (as they apply to utility companies) and establish simplified RF interference reporting procedures.

An online form would probably be the most convenient way for broadcasters and members of the public to report objectionable RF interference to utility companies. However, when I've search the website of my local utility PECO Energy¹¹ under the term "radio interference", no results were found. I've also searched the websites of NYSEG and RG&E (which serve western New York State) under the same term and didn't find any results. If the utilities are hesitant to address these complaints, would it be possible for the FCC to establish an "interference clearing house" at www.fcc.gov?

Objectionable interference from utility lines undoubtedly affects far more AM listeners on a daily basis than the occasional misinterpretation of 47 CFR §15.219(b),¹² yet the Enforcement Bureau doesn't hesitate to investigate and issue Notices of Violation to various hobbyists who have installed 100 mW transmitters on elevated metal support posts.¹³ I can't recall a single instance in the past 40 years when couldn't receive a desired AM station as a result of interference from an otherwise-compliant AM "Rangemaster" (or similar product) elevated on a pole or building, but I encounter

¹¹ <http://www.peco.com>

¹² This rule applies to unlicensed "100 milliwatt" AM transmitters employed by some radio hobbyists to broadcast to a small neighborhood, and limits the total length of the antenna, transmission line, and "ground lead" to 3 meters. One example of a commercially-available transmitter is the Hamilton Rangemaster AM 1000.

¹³ For example, see <http://transition.fcc.gov/eb/FieldNotices/2003/DOC-273690A1.html>

obnoxious power line noise nearly every time I listen to AM stations while driving more than a few miles on local roads, and this "hash" is usually heard across the band. Shouldn't the Enforcement Bureau place more emphasis on resolving widespread interference from illegal utility "spark transmitters" than investigating innocuous hobbyist violations?

Respectfully submitted,
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Exton, PA 19341

January 21, 2014

Attachment: Appendix A

Appendix A

Evaluation of FM Service to Warsaw, Nunda, and Batavia, NY Using a Terrain-Sensitive VHF Propagation Model

Calculations in this study were conducted with the online FM signal prediction tool at the website www.fmfool.com, a companion to the popular site www.tvfool.com. Power, antenna directional pattern, antenna elevation data and geographical coordinates of each station are derived from FCC CDBS. The resulting signal predictions are based on the Longley-Rice propagation model, with parameters set to F(50,50)*

Official reference coordinates were specified as the receive location for each community, and this study assumed a 30 ft (9 m) outdoor receive antenna height. At the lower antenna heights typically found on a vehicle or in a home, actual signal strengths would most likely be several decibels weaker than predicted here.

The column labeled **Rx(dBm)** shows the predicted signal power of each station (decibels relative to one milliwatt) at receiver input for a "unity gain" dipole antenna. At 99 MHz, a field strength of 1 mV/m or 60 dB μ (considered FM "primary service" by the FCC) would produce -55 dBm at the receiver, and "city grade" field strength of 3.16 mV/m or 70 dB μ would provide -45 dBm.

The column labeled **Path** indicates whether the radio signal propagation between transmit and receive antennas follows a clear line-of-sight (LOS) path, or is diffracted over one or more edges of natural terrain features.

The last column labeled **ft AGL LOS** shows how much higher the receive antenna would need to be raised at the particular study location to attain line-of-sight propagation from the radiation center of the respective transmit antenna. Values of 1000 feet and more are not shown.

Please note that WCJW's translator **W279BO** is the only station providing "city grade" line-of-sight FM service to the Village of Warsaw. The only other stations with 60 dB μ (45 dBm) or better service at this location are non-commercial WCOU licensed to Attica, NY, and WLKK licensed to Wethersfield, NY. However, reception of these and other stations is often degraded by multipath distortion, due to obstructed paths. All other signals are categorized as marginal (yellow), poor (pink), or fringe (gray).

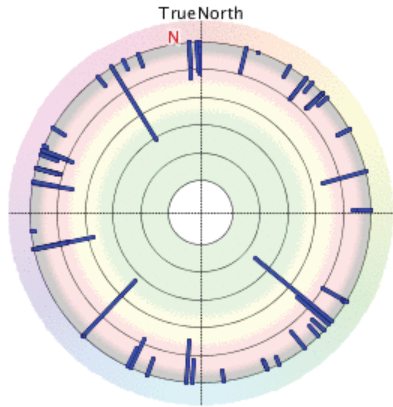
A similar situation exists in the Village of Nunda, where the WCJW translator **W265BX** clearly provides the community's strongest FM service.

The City of Batavia does not suffer from a severe terrain blockage problem, but it is noted that WCJW's translator **W288BZ** provides one of the few "city-grade" signals.

* http://www.fmfool.com/index.php?option=com_content&task=view&id=56&Itemid=76

FM at Warsaw Ref Coords

FM Channels



Search Criteria

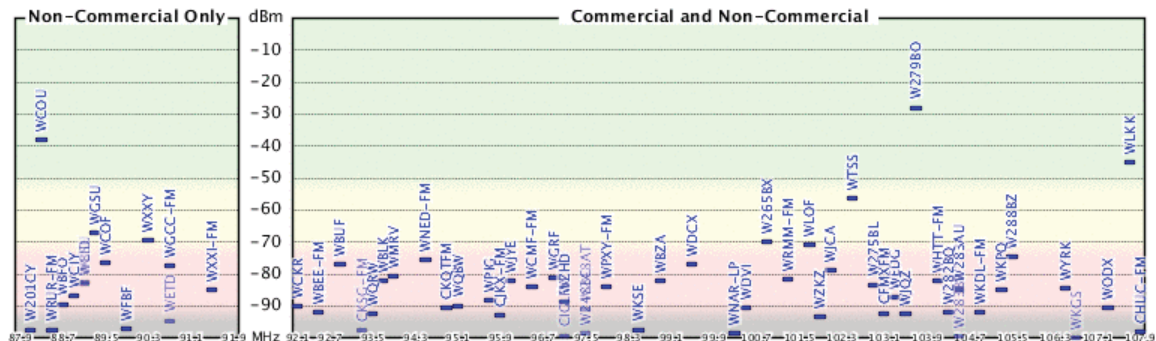
Lat: 42.74***
Lon: -78.14***
Height: 30.0 ft.

www.fmfool.com

Callsign	Channel	Signal		Path	Dist(mi)	Azimuth		ft AGL
		Xmit(kw)	Rx(dBm)			True	(Magn)	LOS
W27980	103.7	0.22	-27.9	LOS	1.6	130°	(141°)	---
WCOU	88.3	4.19	-38.1	2Edge	6.9	329°	(340°)	331.8
WLKK	107.7	19.50	-44.9	2Edge	11.2	224°	(235°)	359.2
WTSS	102.5	110.00	-56.2	2Edge	25.6	257°	(268°)	---
WGSU	89.3	1.80	-67.1	2Edge	16.5	76°	(87°)	919.1
WXXY	90.3	6.00	-69.2	2Edge	25.2	185°	(196°)	934.0
W265BX	100.9	0.25	-69.8	2Edge	17.6	131°	(142°)	608.2
WLOF	101.7	2.80	-70.9	2Edge	16.6	280°	(291°)	---
W288BZ	105.5	0.22	-74.4	2Edge	16.9	356°	(7°)	895.1
WNED-FM	94.5	94.00	-75.5	2Edge	33.0	258°	(269°)	---
WCOF	89.5	1.00	-76.6	2Edge	21.2	204°	(215°)	685.6
WDCX	99.5	110.00	-76.7	2Edge	33.0	257°	(268°)	---
WBUF	92.9	76.00	-77.0	2Edge	40.4	292°	(303°)	---
WGCC-FM	90.7	0.88	-77.4	2Edge	19.1	360°	(11°)	880.7
WJCA	102.1	3.70	-78.7	2Edge	30.9	359°	(10°)	865.8
WMRV	93.9	0.57	-80.6	2Edge	30.0	122°	(133°)	639.4
WGRF	96.9	24.00	-81.0	2Edge	40.4	292°	(303°)	980.6
WRMM-FM	101.3	27.00	-81.5	2Edge	37.8	38°	(49°)	435.7
WHTT-FM	104.1	50.00	-82.0	2Edge	34.3	281°	(292°)	---
WBLK	93.7	47.00	-82.0	2Edge	38.8	285°	(296°)	---
W8ZA	98.9	37.00	-82.2	2Edge	37.8	38°	(49°)	463.1
WJYE	96.1	47.00	-82.2	2Edge	38.8	285°	(296°)	---
WBSU	89.1	7.01	-82.4	2Edge	33.8	16°	(27°)	767.3
WCID	89.1	7.00	-83.2	2Edge	43.0	183°	(194°)	872.0
W275BL	102.9	0.03	-83.2	2Edge	16.9	356°	(7°)	895.1
WPXY-FM	97.9	50.00	-83.9	2Edge	39.0	46°	(57°)	625.5
WCMF-FM	96.5	48.00	-83.9	2Edge	39.0	46°	(57°)	625.5
WYRK	106.5	50.00	-84.4	2Edge	38.8	285°	(296°)	---
WKPK	105.3	43.00	-84.9	2Edge	38.9	143°	(154°)	802.3
WXXI-FM	91.5	45.00	-84.9	2Edge	39.0	46°	(57°)	631.7
W283AU	104.5	0.03	-85.0	2Edge	13.4	205°	(216°)	747.6
WCY	88.9	0.68	-86.6	2Edge	36.1	89°	(100°)	577.4
WEDG	103.3	49.00	-87.3	2Edge	38.0	290°	(301°)	---
WPIG	95.7	43.00	-88.0	2Edge	51.2	198°	(209°)	---
WZHD	97.1	3.90	-88.7	2Edge	33.7	134°	(145°)	---
W8FO	88.7	15.40	-89.3	2Edge	36.7	300°	(311°)	---
WQBW	95.1	50.00	-89.8	2Edge	41.5	61°	(72°)	751.4
WCKR	92.1	2.55	-90.0	2Edge	37.8	136°	(147°)	---
WDVI	100.5	50.00	-90.5	2Edge	41.5	61°	(72°)	751.4
WODX	107.3	0.65	-90.6	2Edge	36.1	89°	(100°)	583.7
CKQT-FM	94.9	50.00	-90.7	2Edge	90.3	338°	(349°)	---
W248AT	97.5	0.01	-90.9	2Edge	21.6	323°	(334°)	---
W282BQ	104.3	0.11	-91.8	2Edge	18.4	41°	(52°)	734.6
WBEE-FM	92.5	50.00	-91.9	2Edge	44.9	48°	(59°)	727.9
WKDL-FM	104.9	6.00	-91.9	2Edge	34.2	31°	(42°)	438.1
CFMX-FM	103.1	86.70	-92.1	2Edge	91.8	360°	(11°)	844.2
WJQZ	103.5	1.75	-92.3	2Edge	47.7	172°	(183°)	851.4
WQRW	93.5	1.10	-92.5	2Edge	41.3	157°	(168°)	910.0
CJKX-FM	95.9	50.00	-93.0	2Edge	96.8	333°	(344°)	---
WZKZ	101.9	1.00	-93.3	2Edge	41.3	157°	(168°)	883.6
WETD	90.7	3.20	-94.5	2Edge	37.4	152°	(163°)	---
WFBF	89.9	16.00	-97.2	2Edge	31.7	264°	(275°)	---
W201CY	88.1	0.01	-97.3	2Edge	30.0	122°	(133°)	654.3
WKSE	98.5	46.00	-97.3	2Edge	47.2	293°	(304°)	---
WRUR-FM	88.5	3.76	-97.3	2Edge	39.0	46°	(57°)	643.3
CKSG-FM	93.3	15.00	-97.6	2Edge	91.8	360°	(11°)	850.4
CHUC-FM	107.9	20.00	-98.1	2Edge	91.8	360°	(11°)	852.8
W248BC	97.5	0.01	-98.3	2Edge	30.1	122°	(133°)	655.8
WNAR-LP	100.3	0.01	-98.6	2Edge	22.1	223°	(234°)	---
CIGL-FM	97.1	50.00	-99.2	Tropo	107.1	20°	(31°)	---
W283BR	104.5	0.01	-99.4	2Edge	30.1	122°	(133°)	662.0
WKGX	106.7	3.20	-100.0	2Edge	39.0	46°	(57°)	643.8
WDX	103.9	0.80	-100.1	2Edge	39.3	43°	(54°)	596.7
WZNE	94.1	1.80	-100.3	2Edge	39.0	46°	(57°)	633.2
CJBC5F	106.3	13.00	-101.0	2Edge	95.2	360°	(11°)	863.9

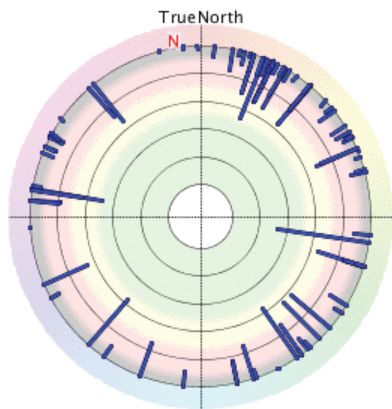
Co-channel warning

Adjacent channel warning



FM at Nunda Ref Coords

FM Channels



Search Criteria

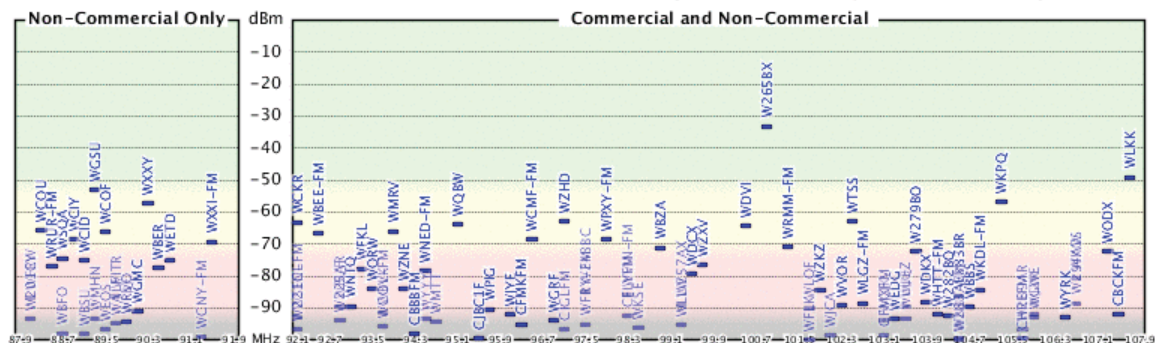
Lat: 42.58***
 Lon: -77.94***
 Height: 30.0 ft.

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Callsign	Channel	Xmit(kw)	Rx(dBm)	Path	Dist(mi)	Azimuth True (Magn)	ft AGL	ft LOS
W265BX	100.9	0.25	-33.1	LOS	3.2	99° (110°)	---	---
WLKK	107.7	19.50	-49.0	2Edge	18.0	279° (291°)	196.8	---
WGSU	89.3	1.80	-52.9	2Edge	16.1	22° (33°)	378.9	---
WKPK	105.3	43.00	-56.7	2Edge	24.1	146° (157°)	---	---
WXXY	90.3	6.00	-57.2	1Edge	18.6	221° (232°)	674.0	---
WTSS	102.5	110.00	-62.8	2Edge	35.4	279° (290°)	---	---
WZHD	97.1	3.90	-62.9	2Edge	18.8	131° (142°)	---	---
WCKR	92.1	2.55	-63.1	2Edge	22.8	136° (147°)	---	---
WQBW	95.1	50.00	-63.7	2Edge	40.8	40° (51°)	759.1	---
WDVI	100.5	50.00	-64.2	2Edge	40.8	40° (51°)	759.1	---
WCOU	88.3	3.20	-65.7	2Edge	21.8	321° (332°)	779.3	---
WMRV	93.9	0.57	-65.9	2Edge	16.2	107° (118°)	---	---
WCOF	89.5	1.00	-66.0	2Edge	20.5	247° (258°)	225.6	---
WBEE-FM	92.5	50.00	-66.6	2Edge	47.4	29° (41°)	557.2	---
WPXY-FM	97.9	50.00	-68.4	2Edge	42.3	25° (36°)	292.0	---
WCMF-FM	96.5	48.00	-68.5	2Edge	42.3	25° (36°)	292.0	---
WCIY	88.9	0.68	-68.6	2Edge	28.5	66° (77°)	632.7	---
WXXI-FM	91.5	45.00	-69.2	2Edge	42.3	25° (36°)	309.7	---
WRMM-FM	101.3	27.00	-71.0	2Edge	42.9	18° (29°)	356.8	---
WBZA	98.9	37.00	-71.1	2Edge	42.9	18° (29°)	364.5	---
WODX	107.3	0.65	-72.2	2Edge	28.5	66° (77°)	764.4	---
W27980	103.7	0.10	-72.2	2Edge	13.4	319° (330°)	450.6	---
WSQA	88.7	0.52	-74.4	2Edge	26.7	144° (155°)	---	---
WCID	89.1	7.00	-75.1	2Edge	34.2	201° (212°)	919.1	---
WETD	90.7	3.20	-75.2	2Edge	23.3	162° (173°)	---	---
WZKV	99.7	2.80	-76.5	2Edge	40.8	40° (51°)	732.7	---
WRUR-FM	88.5	8.28	-76.8	2Edge	42.3	25° (36°)	342.4	---
WBER	90.5	2.50	-77.4	2Edge	40.9	40° (51°)	791.8	---
WFKL	93.3	4.40	-77.6	2Edge	47.4	29° (41°)	631.3	---
WNED-FM	94.5	94.00	-78.4	2Edge	42.5	276° (287°)	---	---
WDCX	99.5	110.00	-79.4	2Edge	42.5	275° (287°)	---	---
WKGS	106.7	4.60	-80.8	2Edge	42.3	25° (36°)	346.3	---
WQRW	93.5	1.10	-84.0	2Edge	27.6	167° (179°)	---	---
WZNE	94.1	1.80	-84.1	2Edge	42.3	25° (36°)	324.2	---
WKDL-FM	104.9	6.00	-84.1	2Edge	41.0	11° (22°)	445.3	---
WZKZ	101.9	1.00	-84.3	2Edge	27.6	167° (179°)	---	---
W248BC	97.5	0.01	-85.1	2Edge	16.2	107° (118°)	---	---
WVIN-FM	98.3	4.50	-85.7	2Edge	34.8	121° (132°)	---	---
W283BR	104.5	0.01	-86.4	2Edge	16.2	107° (118°)	---	---
WITR	89.7	0.91	-86.4	2Edge	37.5	21° (33°)	376.1	---
WFRW	88.1	9.79	-86.7	2Edge	54.7	51° (63°)	---	---
WDKX	103.9	0.80	-88.1	2Edge	43.1	23° (34°)	316.0	---
W294AW	106.7	0.06	-88.3	2Edge	12.4	96° (108°)	---	---
WLGZ-FM	102.7	1.64	-88.4	2Edge	42.9	18° (29°)	392.9	---
WVOR	102.3	3.40	-89.0	2Edge	36.9	58° (69°)	---	---
W257AX	99.3	0.01	-89.1	2Edge	20.3	141° (152°)	---	---
WNTQ	93.1	97.00	-89.3	2Edge	100.6	75° (86°)	---	---
WJQZ	103.5	1.75	-89.3	2Edge	36.3	186° (197°)	---	---
WBUF	92.9	76.00	-89.5	2Edge	54.2	299° (310°)	---	---
W88S	104.7	50.00	-89.7	2Edge	89.7	60° (71°)	---	---
WLOF	101.7	2.80	-89.8	2Edge	29.9	298° (309°)	---	---
WPIG	95.7	43.00	-90.3	2Edge	45.7	215° (226°)	---	---
WOMC	90.1	6.89	-91.1	2Edge	47.5	15° (26°)	---	---
WBLK	93.7	47.00	-91.4	2Edge	52.0	294° (305°)	---	---
WJZR	105.9	3.00	-91.7	2Edge	44.0	24° (36°)	751.4	---
WJYE	96.1	47.00	-91.8	2Edge	52.0	294° (305°)	---	---
WHTT-FM	104.1	50.00	-91.8	2Edge	47.1	292° (303°)	---	---
CBCKFM	107.5	100.00	-91.9	Tropo	138.9	31° (42°)	---	---
W282BQ	104.3	0.11	-92.5	2Edge	25.0	5° (16°)	452.0	---
CFLYFM	98.3	96.00	-92.5	Tropo	143.2	27° (38°)	---	---
WSEN-FM	92.1	25.00	-92.8	2Edge	91.1	62° (74°)	---	---
WYRK	106.5	50.00	-93.0	2Edge	52.0	294° (305°)	---	---
WQWE	105.9	7.00	-93.0	2Edge	50.0	242° (253°)	---	---
WUUF	103.5	6.00	-93.0	2Edge	61.7	39° (51°)	---	---
WMHN	89.3	1.00	-93.2	2Edge	51.2	29° (40°)	---	---

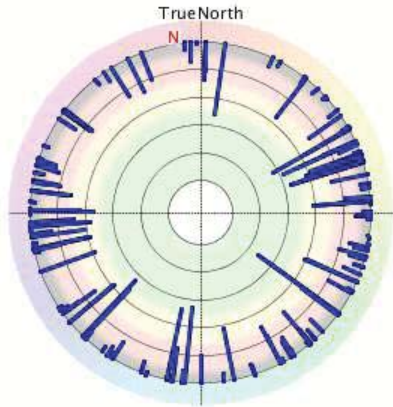
Co-channel warning

Adjacent channel warning



Batavia Reference Coords

FM Channels



Search Criteria

Lat: 43.00***
Lon: -78.18***
Height: 30.0 ft.

www.fmfool.com

Callsign	Channel	Signal		Path	Dist(mi)	Azimuth		ft AGL
		Xmit(kw)	Rx(dBm)			True	(Magn)	
W288BZ	105.5	0.19	-28.4	LOS	1.5	126°	(137°)	
WGCC-FM	90.7	0.88	-36.7	LOS	2.7	61°	(72°)	
W275BL	102.9	0.02	-37.5	LOS	1.5	126°	(137°)	
WRMM-FM	101.3	27.00	-42.4	LOS	28.5	65°	(76°)	27.2
WTSS	102.5	110.00	-44.5	LOS	32.4	224°	(235°)	
WPXY-FM	97.9	50.00	-45.0	LOS	31.8	73°	(84°)	29.1
WCNF-FM	96.5	48.00	-45.1	LOS	31.8	73°	(84°)	29.1
WCOU	88.3	2.64	-45.4	1Edge	11.9	186°	(197°)	41.6
WLKK	107.7	19.50	-47.6	1Edge	26.4	191°	(203°)	164.1
WJCA	102.1	3.70	-48.4	1Edge	13.3	8°	(19°)	33.9
WLOF	101.7	2.80	-52.3	LOS	20.4	223°	(234°)	
WBZA	98.9	37.00	-53.2	1Edge	28.5	65°	(76°)	30.5
WXXI-FM	91.5	45.00	-54.1	1Edge	31.8	73°	(84°)	30.5
WBFO	88.7	49.09	-54.2	2Edge	29.4	271°	(282°)	103.6
WBUF	92.9	54.95	-56.7	2Edge	35.2	265°	(276°)	101.2
WBEE-FM	92.5	50.00	-57.0	1Edge	37.8	71°	(82°)	37.7
WQBW	95.1	50.00	-58.1	2Edge	38.7	86°	(97°)	96.4
WDVI	100.5	50.00	-58.5	2Edge	38.7	86°	(97°)	96.4
WNED-FM	94.5	94.00	-58.6	2Edge	38.8	230°	(241°)	178.5
WHTT-FM	104.1	50.00	-58.8	2Edge	33.3	250°	(261°)	143.9
WBLK	93.7	47.00	-58.8	2Edge	35.8	258°	(269°)	97.8
WJYE	96.1	47.00	-59.0	2Edge	35.8	258°	(269°)	97.8
WDCX	99.5	110.00	-59.1	2Edge	38.8	230°	(241°)	208.3
WGRF	96.9	24.00	-59.2	2Edge	35.2	265°	(276°)	74.3
WCIY	88.9	0.68	-59.4	LOS	42.3	114°	(125°)	9.4
WYRK	106.5	50.00	-60.2	2Edge	35.8	258°	(269°)	110.3
WODX	107.3	0.65	-61.0	LOS	42.2	114°	(125°)	17.1
WDKX	103.9	0.80	-61.8	LOS	31.3	70°	(81°)	29.1
W279BO	103.7	0.18	-62.0	1Edge	19.1	169°	(180°)	435.7
WEDG	103.3	49.00	-62.0	2Edge	33.7	262°	(273°)	181.4
WKDL-FM	104.9	6.00	-62.6	2Edge	23.3	60°	(72°)	43.0
WKSE	98.5	46.00	-63.7	2Edge	41.0	271°	(282°)	180.5
WBSU	89.1	7.07	-64.5	2Edge	18.8	38°	(49°)	442.4
WRUR-FM	88.5	2.72	-66.6	1Edge	31.8	73°	(84°)	33.4
WGSU	89.3	1.80	-68.2	2Edge	23.1	127°	(138°)	758.6
WFKL	93.3	4.40	-68.4	1Edge	37.8	71°	(82°)	42.5
WZNE	94.1	1.80	-68.5	1Edge	31.8	73°	(84°)	32.0
W248AT	97.5	0.01	-68.8	LOS	10.5	267°	(278°)	
WKGS	106.7	1.82	-68.9	1Edge	31.7	73°	(84°)	33.4
W265BX	100.9	0.25	-70.1	2Edge	33.3	152°	(163°)	394.8
WMRV	93.9	0.57	-70.6	2Edge	43.7	140°	(151°)	178.1
WZXV	99.7	2.80	-71.0	2Edge	38.7	86°	(97°)	94.9
WBER	90.5	2.50	-71.1	2Edge	38.8	86°	(97°)	114.6
CHRE FM	105.7	50.00	-71.3	2Edge	51.9	278°	(289°)	329.4
WFBF	89.9	16.00	-71.6	2Edge	36.0	234°	(245°)	808.1
WQMC	90.1	15.00	-72.2	2Edge	30.1	55°	(67°)	475.1
CHTZ FM	97.7	50.00	-72.4	2Edge	55.0	278°	(289°)	387.1
CFMX FM	103.1	86.70	-72.9	2Edge	74.0	2°	(13°)	128.6
CKQT FM	94.9	50.00	-73.7	2Edge	73.0	335°	(346°)	213.1
WITR	89.7	0.91	-74.2	2Edge	26.8	77°	(88°)	45.9
CJRT	91.1	40.00	-75.2	2Edge	75.2	307°	(318°)	120.4
CJXX-FM	95.9	50.00	-75.2	2Edge	80.1	328°	(340°)	323.7
CFMX-FM*	96.3	60.00	-75.3	2Edge	75.2	307°	(318°)	327.0
WLZ-FM	102.7	0.68	-75.4	2Edge	28.5	65°	(76°)	47.8
CHIF FM	98.1	44.00	-75.6	2Edge	75.2	307°	(318°)	136.2
CBL FM	94.1	38.00	-75.8	2Edge	75.2	307°	(318°)	136.2
CFNY FM	102.1	61.00	-76.1	2Edge	75.0	307°	(318°)	316.5
CKFM FM	99.9	40.00	-76.2	2Edge	75.2	307°	(318°)	136.2
WCOF	89.5	1.00	-76.2	2Edge	37.6	190°	(201°)	---
CFLZ-FM	105.1	15.00	-76.3	2Edge	52.6	278°	(289°)	354.0
CHUM FM	104.5	40.00	-76.6	2Edge	75.2	307°	(318°)	136.2
CILQ FM	107.1	40.00	-76.8	2Edge	75.2	307°	(318°)	136.2
WKPO	105.3	43.00	-77.8	2Edge	55.3	152°	(163°)	---
WJZR	105.9	3.00	-78.6	2Edge	32.6	70°	(81°)	114.1
CKSG-FM	93.3	15.00	-78.7	2Edge	74.0	2°	(13°)	152.1

Co-channel warning

Adjacent channel warning

